

## Amendment to the claims under PCT Article 19

## CLAIMS

1. (Amended) Exercise equipment comprising: work load means  
(9) providing a variable work load; physiological signal measurement means  
5 (1) noninvasively measuring a physiological signal during an exercise  
involving said work load means (9); and load variation rate decision means  
(6) driven by a physiological signal obtained during the exercise, to  
determine a load variation rate of an incremental or decremental load, said  
load variation rate decision means (6) changing a work load at said load  
10 variation rate.
2. The exercise equipment of claim 1, wherein said physiological  
signal is one of an electrocardiographical signal and a pulsation signal.
- 15 3. The exercise equipment of claim 1, wherein said physiological  
signal is a heart rate variability obtained from an electrocardiographical  
signal.
- 20 4. The exercise equipment of claim 3, wherein said heart rate  
variability is heart rate variability power.
5. The exercise equipment of claim 3, wherein said heart rate  
variability is entropy of heart rate variability.
- 25 6. The exercise equipment of claim 1, wherein said physiological  
signal is power spectrum of heart rate variability.
- 30 7. The exercise equipment of claim 1, wherein said physiological  
signal is both of at least one of a heart rate obtained from an  
electrocardiographical signal and a pulse count obtained from a pulsation  
signal, and heart rate variability obtained from the electrocardiographical  
signal.

8. The exercise equipment of claim 7, wherein said heart rate variability is heart rate variability power.

5 9. The exercise equipment of claim 7, wherein said heart rate variability is entropy of heart rate variability.

10 10. The exercise equipment of claim 1, wherein said physiological signal is both of at least one of a heart rate obtained from an electrocardiographical signal and a pulse count obtained from a pulsation signal, and power spectrum of heart rate variability.

15 11. (Amended) An apparatus estimating a physical fitness level, comprising: physiological signal measurement means (1) noninvasively measuring a physiological signal during an exercise; load variation rate decision means (6) driven by said physiological signal obtained during the exercise, to determine a load variation rate of an incremental or decremental load; and physical fitness level estimation means (6) estimating a physical fitness level from a relationship between a work load and a heart rate during an exercise with said load incremented or decremented at said load variation rate determined.

20 12. (Amended) An apparatus determining an exercise intensity, comprising: physiological signal measurement means noninvasively measuring a physiological signal during an exercise; load variation rate decision means (6) driven by a physiological signal obtained during the exercise, to determine a load variation rate of an incremental or decremental load; and exercise intensity decision means (6) determining an optimal exercise intensity from a relationship between a work load and a heart rate variability during an exercise with said load incremented or decremented at said load variation rate determined.

25 30 13. The apparatus of claim 12, wherein said heart rate variability is heart rate variability power.

14. The apparatus of claim 12, wherein said heart rate variability is entropy of heart rate variability.

5 15. (Amended) An apparatus determining an exercise intensity, comprising: physiological signal measurement means noninvasively measuring a physiological signal during an exercise; load variation rate decision means (6) driven by a physiological signal obtained during the exercise, to determine a load variation rate of an incremental or decremental  
10 load; and exercise intensity decision means (6) determining an optimal exercise intensity from a relationship between a work load and power spectrum of heart rate variability during an exercise with said load incremented or decremented at said load variation rate determined.

15 16. Exercise equipment comprising work load means (9) providing a variable work load and the apparatus of any of claims 11, 12 and 15, wherein said work load means (9) changes a work load to reflect one of a physical fitness level obtained from the apparatus estimating a physical fitness level and an exercise intensity obtained from the apparatus  
20 determining an exercise intensity.

25 17. (Amended) A method of determining an exercise intensity of exercise equipment having a storage unit (6) having stored therein a plurality of physiological-signal variation patterns obtained during an exercise having a load, noninvasively measuring a physiological signal during an exercise having a load, determining said physiological-signal variation pattern matching a pattern in variation of said physiological signal obtained in said measuring during the exercise having said load, and  
30 determining an appropriate exercise intensity with a determined pattern taken into consideration.

18. (Amended) The method of claim 17, wherein said variation pattern is determined in a warmup from a predetermined time interval

associated with a work load increasing or from a physiological signal variation rate for each work load value interval.

5 19. (Amended) The method of claim 17, wherein said physiological signal is one of an electrocardiographical signal and a pulsation signal.

10 20. The method of claim 17, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.

21. (Amended) The method of claim 20, wherein said heart rate variability is heart rate variability power.

15 22. The method of any of claims 17-20, wherein said appropriate exercise intensity corresponding to said variation pattern is determined by a method of an operation corresponding to said variation pattern.

20 23. (Amended) Exercise equipment comprising a load device (9) providing a variable load, a storage unit (6) having stored therein a plurality of physiological-signal variation patterns obtained during an exercise having a load, physiological signal measuring means (1) measuring a physiological signal invasively over time, decision means determining said physiological-signal variation pattern matching a pattern in variation of said physiological signal obtained by said physiological signal measuring means (1) during the exercise having said load, and exercise intensity determination means (6) determining an appropriate exercise intensity with said pattern determined taken into account, wherein said load device provides a load set to correspond to said exercise intensity determined by said exercise intensity determination means (6).

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24. (Amended) Exercise equipment comprising a load device (9) providing a variable load, a storage unit (6) having stored therein a plurality of physiological-signal variation patterns obtained during an exercise

having a load, physiological signal measuring means (1) measuring a physiological signal invasively over time, decision means determining said physiological-signal variation pattern matching a pattern in variation of said physiological signal obtained by said physiological signal measuring means (1) during the exercise having said load, and physical condition determination means (6) determining a physical condition from said pattern determined.

25. The exercise equipment of any of claims 23 and 24, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.

26. (Amended) An apparatus providing an assistance to determine a physical condition, comprising a storage unit (6) having stored therein a plurality of physiological-signal variation patterns obtained during an exercise having a load, physiological signal measuring means (1) measuring a physiological signal invasively over time, variation pattern determination means (6) determining said physiological-signal variation pattern matching a pattern in variation of said physiological signal obtained by said physiological signal measuring means (1) during the exercise having said load, and output means (6) outputting said pattern determined.

27. The apparatus of claim 26, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.

28. (Amended) A measurement apparatus comprising a storage unit (6) having stored therein a plurality of physiological-signal variation patterns obtained during an exercise having a load, physiological signal measuring means (1) measuring a physiological signal invasively over time, decision means (6) determining said physiological-signal variation pattern matching a pattern in variation of said physiological signal measured by said physiological signal measuring means (1) during the exercise having said load, physical condition determination means (6) determining a

physical condition from said pattern determined, and output means outputting said physical condition determined.

- 5        29. The measurement apparatus of claim 28, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.

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